



INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

<p>(51) International Patent Classification ⁶ : H04N 7/00</p>	A1	<p>(11) International Publication Number: WO 95/25402</p> <p>(43) International Publication Date: 21 September 1995 (21.09.95)</p>
<p>(21) International Application Number: PCT/US95/03217</p> <p>(22) International Filing Date: 15 March 1995 (15.03.95)</p> <p>(30) Priority Data: 08/213,342 15 March 1994 (15.03.94) US</p> <p>(60) Parent Application or Grant (63) Related by Continuation US 08/213,342 (CIP) Filed on Not furnished</p> <p>(71) Applicant (for all designated States except US): SPRUCE RUN TECHNOLOGIES, INC. [US/US]; R.D. #3, Box 477C, Lewisburg, PA 17837 (US).</p> <p>(72) Inventors; and (75) Inventors/Applicants (for US only): ALBERT, Eric, K. [US/US]; 436 Brentwood Drive, Cogan Station, PA 17728 (US). CONNOLEY, Stephen, J. [US/US]; R.D. #3, Box 477C, Lewisburg, PA 17837 (US).</p> <p>(74) Agents: FREE, Albert, L. et al.; Synnestvedt & Lechner, Suite 2600, 1101 Market Street, Philadelphia, PA 19107-2950 (US).</p>		<p>(81) Designated States: AM, AT, AU, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK, EE, ES, FI, GB, GE, HU, JP, KE, KG, KP, KR, KZ, LK, LR, LT, LU, LV, MD, MG, MN, MW, MX, NL, NO, NZ, PL, PT, RO, RU, SD, SE, SI, SK, TJ, TT, UA, US, UZ, VN, European patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG), ARIPO patent (KE, MW, SD, SZ, UG).</p> <p>Published <i>With international search report. Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i></p>
<p>(54) Title: VIDEO SIGNAL BLOCKING APPARATUS AND METHOD</p>		
<pre> graph TD 24[MICRO-PROCESSOR] <--> Bus 33[32K RAM] <--> Bus 35[24K ROM] <--> Bus 28[CLOCK] <--> Bus Bus <--> 14[DISPLAY] Bus <--> 36[I.F. RECEIVER/DECODER] Bus <--> 30[TUNER INTERFACE] </pre>		
<p>(57) Abstract</p> <p>A device for preprogramming a television to block out a cable TV signal wherein said device comprises: a housing for coupling said device to a CATV input of a television set; means for inputting (36) a pre-coded number which identifies the time and the channel of the television program to be blocked out; display means (14) for displaying the pre-coded number which is input into the device; memory means (33) for storing said number; and processor means (24) which operates under the control of a pre-stored computer program (35) to blank out the channel of said television program at the time identified by said pre-coded number stored in said memory means (33).</p>		

FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AT	Austria	GB	United Kingdom	MR	Mauritania
AU	Australia	GE	Georgia	MW	Malawi
BB	Barbados	GN	Guinea	NE	Niger
BE	Belgium	GR	Greece	NL	Netherlands
BF	Burkina Faso	HU	Hungary	NO	Norway
BG	Bulgaria	IE	Ireland	NZ	New Zealand
BJ	Benin	IT	Italy	PL	Poland
BR	Brazil	JP	Japan	PT	Portugal
BY	Belarus	KE	Kenya	RO	Romania
CA	Canada	KG	Kyrgystan	RU	Russian Federation
CF	Central African Republic	KP	Democratic People's Republic of Korea	SD	Sudan
CG	Congo	KR	Republic of Korea	SE	Sweden
CH	Switzerland	KZ	Kazakhstan	SI	Slovenia
CI	Côte d'Ivoire	LI	Liechtenstein	SK	Slovakia
CM	Cameroon	LK	Sri Lanka	SN	Senegal
CN	China	LU	Luxembourg	TD	Chad
CS	Czechoslovakia	LV	Latvia	TG	Togo
CZ	Czech Republic	MC	Monaco	TJ	Tajikistan
DE	Germany	MD	Republic of Moldova	TT	Trinidad and Tobago
DK	Denmark	MG	Madagascar	UA	Ukraine
ES	Spain	ML	Mali	US	United States of America
FI	Finland	MN	Mongolia	UZ	Uzbekistan
FR	France			VN	Viet Nam
GA	Gabon				

VIDEO SIGNAL BLOCKING APPARATUS AND METHOD

FIELD OF THE INVENTION

The present invention is directed to an apparatus and method for blocking selected programs from a television connected to a coaxial cable (CATV). In particular, the present invention is
5 directed to a system and device for blocking unwanted or undesired television programs.

BACKGROUND OF THE INVENTION

The present invention is directed to systems for blocking
10 video communication on certain television channels. Recently there has been great concern among educators and parents regarding the harmful effects of television programs having a violent or sexual nature on the nation's youth. Recent studies have shown a direct correlation between such programming and
15 violent behavior on the part of children and adolescents.

With the proliferation of cable television and cable television networks, many cable TV subscribers have access of up to 60 or more channels at one time. These channels cover broad geographical areas but are also divided by subject matter. Often
20 cable TV programming, particularly programming on premium

-2-

entertainment channels such as Home Box Office (HBO), is of a violent or sexually explicit nature. Because of the changing work patterns of American families, it is often difficult for parents to control and supervise children's viewing habits, particularly during the after school hours.

A number of political, social and religious organizations have taken a leading role in trying to enact codes, regulations and legislation to prevent access by children and adolescents to television of a violent or sexual nature and to curb such programming in general. Many of these organizations publish literature and magazines which preview television programming and advise parents and educators of upcoming programming which may be of an explicit or violent nature. While these groups are able to provide guides for parents and others to use in the process of program selection, they do not provide a method of enforcement.

More recently, there has been an effort to develop new technologies for selectively blocking out unwanted television programming. As will be discussed below, these devices have heretofore been complicated and produce undesirable side effects. A number of issued United States Patents are directed to the problem of blocking or controlling unwanted television programming.

U.S. Patent No. 4,510,623 discloses an electronically tuned television receiver with a channel lockout feature to control viewer program selection. The television receiver has a tuner, the frequency of which is controlled by a phase lock loop having a programmable frequency divider. A microprocessor receives a

-3-

user input from a keyboard or remote transmitter indicating a desired channel. In response to this input, the microprocessor normally loads a programmable constant in the programmable frequency divider to cause the tuner to be tuned to the desired channel. However, the microprocessor is programmed to respond to a user entered lockout code sequence to store in a non-volatile memory one or more channels to be inhibited for a predetermined period of time. Should a user input indicate one of the inhibited channels, the microprocessor does not load the corresponding programmable constant. The television receiver continues to receive the last valid channel selected. Once the predetermined period of time has elapsed, the television receiver reverts to normal tuning operation for all channels.

U.S. Patent No. 5,231,661 discloses a device and method for controlling television usage. The owner of the device establishes user access codes which authorize multiple users and which provide a time allotment to each of the users (i.e. television, VCR, video entertainment systems). Each user who has been given an allotted time may be given additional time. Each user's coded and allotted time is decremented for the amount of time of actual viewing. An activating means controls the switches and the selected video signal, and upon matching the user entered code against the owner selected code, determines whether viewing will be blocked or unblocked. Any unmatched code switches the signal to the off-state of the device's apparatus.

U.S. Patent No. 5,250,767 discloses a television receiver signal blocking system which includes a box from which electrical conductors are connected to the television receiver in a signal

-4-

source, such as a television cable, within the television signal blocking mechanism or box is a rotatable matching member which includes a latching arm and a switch carrying arm. The latching member is rotatable between three positions which permit the television signal blocking box to be opened to gain access to its interior; a second position in which the box is latched closed and the signal is not blocked; and a third position in which the box is closed and the signal is blocked.

U.S. Patent No. 4,496,986 discloses an interface for subscription television reception which restores the program selection function to the tuner of the television receiver.

U.S. Patent No. 4,706,121 discloses a system which controls a television receiver so as to allow user selection of broadcast programs from schedule information. The schedule information for the selected programs is stored in a memory, and is used by the data processor to control a programmable TV tuner to provide the broadcast signals for the selected programs to the TV receiver at the time of broadcast.

U.S. Patent No. 5,168,372 discloses a video viewing control system which permits, for example, a parent to enter a viewing "allowance" (time) for a child and which disables viewing of a television by disrupting the television's Radio Frequency (RF) input signal or video input signal when the child has watched television for his allowable time period. The child's viewing time can be set on a daily basis (potentially different for each day of the week) or on a weekly basis. Block out times (during which television viewing is disabled) can be programmed for a plurality of children on the hour and half-hour for any day of

-5-

the week. The system calculates and displays each child's average viewing time per day and the total viewing time over any desired period.

U.S. Patent No. 4,375,651 discloses a system for controlling
5 a channel/band selective microcomputer programmed indirect frequency synthesis tuner. Separate groups of VHF, UHF or CATV channels are programmed by means of a key switch having a plurality of positions of engagement corresponding to individual groupings of channels. The channels within each group may be
10 programmed for viewing by means of channel UP and DOWN selector keys. The television receiver is turned on by viewer selection of either the channel UP or DOWN control resulting in tuning to either the lowest or highest "saved" channel. An OFF function is activated anytime an attempt is made to advance past either
15 the highest or lowest programmed channel. The television receiver control is by means of a single user selector.

U.S. Patent No. 4,635,121 discloses a device for programming a radio and/or television receiver for future transmissions. Individually programmed transmissions are provided with priority
20 data which control sequencing overlapping transmissions.

U.S. Patent No. 4,743,968 discloses a system for controlling a television receiver. The system employs a control circuit having a control program in a ROM which sequentially communicates over an internal system bus in a predetermined interval with a
25 plurality of controllable, operational circuit blocks forming the electronic apparatus. In one embodiment, a request signal is transmitted prior to a vertical blanking interval. A dedicated line is provided from a selected controllable unit to the control

-6-

unit, such that the request signal can be transmitted at any time, irrespective of whether data is being transferred.

U.S. Patent No. 4,317,213 discloses an apparatus for selectively inhibiting reception of television broadcast signals.

5 The apparatus includes a number of signal generating circuits, each respectively set to generate an electrical signal substantially equal to the carrier frequency of a corresponding television broadcast signal. The system includes a timer capable of being preset to activate and deactivate selected
10 oscillators on a timed basis. The signal generating circuits are coupled to the antenna input leads of the television receiver so that when activated the electrical signals produced thereby cause sufficient interference with the corresponding incoming television broadcast signal to effectively block reception.

15 Each of the above devices and methods for blocking a television reception signal is complicated or produces undesirable side effects. This prior art is characterized by devices which are mechanical in nature or which are grounded in blocking out periods of time or which block out entire channels.
20 There is a long felt need for a device and method which can be easily programmed to block out unwanted television programming on individual channels. It would be desirable to provide a video blocking device which can be programmed by date and time to block out specific programs on individual channels.

25 SUMMARY OF THE INVENTION

In accordance with the present invention, the present invention is directed to a device for programming a television to block-out a cable TV signal. In a most preferred embodiment,

-7-

the invention comprises means for reading in event information which relates to and identifies a television program to be blocked; and means responsive to said event information for blocking out a selected television program from said television.

5 In a more preferred embodiment, the present invention is directed to a device for programming a television to block-out a cable TV signal comprising: a housing for storing said device and for coupling said device to the CATV input of a television set said housing means comprising; means for accepting in a pre-
10 coded number which identifies the time and channel of a television program to be blocked out on said television set; memory means for storing said pre-coded number; processor means under the control of a pre-stored computer program for blanking out the channel of said television program at the time identified
15 by said pre-coded number.

 In still a more preferred embodiment, the present invention is directed to a device for preprogramming a television to block-out a cable TV signal comprising: a housing for storing said device and for coupling said device to the CATV input of a
20 television set said housing means comprising; means for inputting a pre-coded number which identifies the time and channel of a television program to be blocked out on said television set; display means for displaying the pre-coded number as it is input into the device; memory means for storing said pre-coded number;
25 processor means under the control of a pre-stored computer program for blanking out the channel of said television program at the time identified by said pre-coded number stored in said memory.

-8-

The present invention is also directed to a method for preprogramming a television to block-out a cable TV signal comprising the following steps: inputting a pre-coded number into a blocking device which identifies the time and channel of a television program to be blocked out on said television set;
5 tracking the real time date and time; storing said pre-coded number in a memory; blocking out the channel of said television program at the time identified by said pre-coded number stored in said memory at the appropriate date and time.

10 These and other features of the present invention will become apparent from the detailed description and claims which follow.

BRIEF DESCRIPTION OF THE FIGURES

Figure 1 is a diagram of a video blocking apparatus in accordance with the present invention in conjunction with an IR
15 control device.

Figure 2 is a perspective view of the video controller of the present invention.

Figure 3 is a block diagram of a video blocker apparatus in accordance with the present invention.
20

Figure 4 is a more preferred embodiment of the video blocker apparatus of the present invention.

Figures 5 and 5A are algorithmic flow charts of the control system of the present invention.

-9-

DESCRIPTION OF THE PREFERRED EMBODIMENT

The video blocking device of the present invention is described with reference to the enclosed Figures wherein the same numbers are utilized where applicable. Referring to Figures 1 and 2, the video blocking device and apparatus 10 of the present invention is disclosed in a preferred embodiment. As shown, the device 10 of the present invention comprises a box-like structure 12 which houses the circuitry and which may be placed in proximity to a television receiver 15 and VCR 17. Device 10 replaces the CATV tuner module. The apparatus 10 and the VCR 17 are connected via a cable 19. The box-shaped structure 12 may contain an LED or LCD display, read-out or screen 14, which as will be described below, may be used to help program the device. The device is programmed via a hand-held infrared controller 21. Alternatively, the device could be programmed with other data input means. For example, the invention could include a bar code interface with an add-on wand and associated software. This would permit the creation of a unique or proprietary code which could accompany programming literature sent to parents. The user could read-in via the bar code reader those events he wishes to include or exclude.

It is to be appreciated that while the present invention is being described in the context of a system contained within a stand-alone box-like housing, the circuitry of the present invention could be reduced to a circuit or chip which could be inserted into a television receiver, VCR or remote control.

In operation, circuitry housed within the box-shaped structure 12 is programmed to accept event information relating

-10-

to television programming which is to be selectively blocked out. The present invention is intended to be used with individual CATV channel numbers and time slots. These are multiple digit numerals which identify individual television programs and which are shown on cable television. The data could comprises VCR+® time codes. These codes appear in weekly TV directories and are used to program VCR to record at prerecorded times. For the purpose of this disclosure, the term "Event Information" refers to data such as a pre-coded number which is used to identify selected programming.

Referring now to Figures 3 and 4, block diagrams of the invention comprising a microprocessor-based control system are shown. Referring to Figure 3, in a most preferred embodiment, the present invention comprises a microprocessor-based control system. The system incorporates a microprocessor 24, Random Access Memory (RAM) 26 or ROM, LED or LCD display 14, a clock 28 and a tuner interface 30. The RAM 26 stores information pertaining to the operation of the device and software code. The microprocessor 24 of the present invention is an eight-bit device of the Intel Controller series, either an 831/8052-type chip. The microprocessor 24 is utilized in association with support circuitry which provides address encoding and timing signals which permit the memory and peripheral to interact and share data with the software in the ROM and storage in RAM. Parallel data interface chips provide logic-level I/O to control the tuner. The support circuitry processes interrupts from the IR system to accept key presses from the IR hand-held controller. The software embedded in the system is self-contained and coordinates

-11-

all activities of the system.

Referring to Figure 4, a more preferred embodiment is shown. A static RAM 33 provides the ability to store non-volatile information pertaining to the operation of the device. A ROM or
5 EPROM 35 contains software code either as an intermediate tokenized code or as a compiled code set at the machine language level. The unit will have an infrared receiver/decode 36 similar to those commonly found in consumer equipment for receiving infrared signal from hand-held control mechanism 21.

10 The device 10 will have a display unit which permits the device to display data (text and/or numbers in menus). The information presented could be on an LCD panel and the display could utilize the screen of the television itself.

The device of the present invention also incorporates a
15 real-time clock/calendar 28 which, in a preferred embodiment comprises a 32766 hertz oscillator crystal and a signal chip which maintains the date, day of week, hour, minute and second and housekeeping day data. The clock circuit 30 communicates to the microprocessor 26 by direct memory access, thus the data
20 appears on the chip's memory address space.

The device 10 is connected to the microprocessor via an interface 32 so that the channel selection is performed by sending data from the microprocessor to the device 10. This data selects the channel that the device 10 downconverts from the
25 cable system to the user's choice of television channels 3 or 4.

The method of channel selection is determined by a complex software algorithm which demodulates the CATV signal to

-12-

individual channels. Under the present invention, no direct manual tuning capability is available to the user directly into the tuner module, as all channel selection information is controlled through the microprocessor under the present invention.

In a preferred embodiment, the device 10 is powered by AC line voltage in accordance with standard UL practice. A mechanical hatch with a key may be provided on the enclosure to lock the cable connections and indicate to the microprocessor that the person authorized to modify locked settings is present.

The operation of the present invention is now described with reference to the Figures and the flow chart algorithm of Figures 5 and 5A. Upon first powering-up by the user, the device will require setup. This will be queried by the software through the display and answers will be chosen through the use of the IR controller.

First time information to be entered:

1. Time
2. Date
3. Master key User Passcode
4. Channel blocking mode

The time and date information comprise the present date and time. The master key user passcode is a 4 digit security code chosen by the user. Once entered, it is stored by RAM. The password cannot be changed until the access hatch (to cover the cable connections) is unlocked and opened. Neither the time nor date can be changed, nor the event -- e.g., allow only those programming events to occur that are entered in the keypad, or

-13-

block those programming events that are entered in the keypad. Once this information (items 1-4 identified previously) is entered and the access hatch is closed and locked, the unit is now ready for programming.

5 A programming event is a set of data that consists of the following information:

1. CATV channel number
2. Date
3. Start Time
- 10 4. End Time
5. Pattern (which can be set out as Monday through Friday, Saturday/Sunday, once only)

Upon command from the IR controller, the user can enter an event consisting of the 5 items of data above. When this is done, the event is stored and cannot be deleted unless the user
15 passcode is entered. The battery backed RAM also stores information, in the event of a power failure.

The device responds to channel requests from the user through the hand held IR controller 21 unless a programmed event
20 is detected. That is, the device will allow direct channel selection, channel up, channel down, etc., to select a single CATV channel from the cable input. This single channel will be provided to the TV on user selected channel 3 or 4.

At all times the software is scanning the event table to
25 determine if the presently selected channel is allowed for selection. If the device is in the "allow" mode, then only those event channels and times will be able to be selected. If the device is in "block" mode, then all channels will be able to be

-14-

selected unless an event is present that would block the selection.

Whenever a channel is blocked by either mode of operation, the television screen 15 will report that the selection is unavailable. A blocked channel will thus be nonviewable on the television during the event time. According to the pattern of selection by the user, a channel may be entirely nonviewable, mostly viewable, or simply blocked during specific viewable time slots.

It is to be appreciated that additional features and benefits of the present invention are suggested by the present disclosure. For example, an instant block or zap button could be placed on the IR controller 21 which could block the currently selected channel for a predetermined period (e.g., less than three minutes), the time corresponding to the initial setup of the system. A second variation suggested by the present invention is that the stored event table could be interrogated by an external data service through a telephone modem, thus collecting user data (with the user's knowledge and permission) to determine channel blocking information for marketing surveys. This would entail another model or a bus interface with additional software and a hardware plug-in to add the communications interface.

In summary, the present invention operates as a parental choice system to control the television programming channels an individual can watch based entirely on the selection of the parent or key holder and through a flexible schedule system that permits multiple patterns of blocking of signals. The system of

-15-

the present invention can be programmed with up to 50 events.

The present invention has been described with reference to the above detailed description. It is to be appreciated that other embodiments fulfill the spirit and scope of the present invention and that the true nature and scope of the present invention is to be determined with reference to the claims appended hereto.

-16-

CLAIMS

What is claimed is:

1. A device for programming a television to block-out a cable TV signal comprising:

5 means for reading in event information which relates to and identifies a television program to be blocked; and

means responsive to said event information for blocking out said selected television program from said television.

10 2. The device of claim 1 wherein said reading means comprises an infrared controller.

3. The device of claim 1 wherein said device comprises an electronic chip.

15

4. A device for programming a television to block-out a cable TV signal comprising:

a housing for storing said device and for coupling said device to the CATV input of a television set, said housing means
20 further comprising;

means for accepting data which identifies the time and channel of a television program to be blocked out on said television set;

memory means for storing said data;

25

processor means under the control of a pre-stored computer program for blocking out the channel of said television program at the time identified by said data.

-17-

5. A device for preprogramming a television to block-out a cable TV signal comprising:

a housing for storing said device and for coupling said device to the CATV input of a television set, said housing means
5 comprising;

means for inputting a pre-coded number which identifies the time and channel of a television program to be blocked out on said television set;

display means for displaying the pre-coded number as it is
10 input into the device;

memory means for storing said pre-coded number;

processor means under the control of a pre-stored computer program for blanking out the channel of said television program at the time identified by said pre-coded number stored in said
15 memory.

6. The device of claim 5 wherein said display means is an LCD display means.

20 7. The device of claim 5 wherein said display means is said television display.

8. The device of claim 5 wherein said pre-stored computer program for blocking out the channel of issues an
25 override signal which blanks out the television program identified by the pre-coded number stored in said memory.

9. A device for preprogramming a television to block-

-18-

out a cable TV signal comprising:

a housing for storing said device and for coupling said device to the CATV input of a television set said housing means further comprising;

5 means for inputting a pre-coded number which identifies the time and channel of a television program to be blocked out on said television set;

clock means for tracking the real date and time;

display means for displaying the pre-coded number as it is
10 input into the device;

memory means for storing said pre-coded number;

processor means under the control of a pre-stored computer program for blanking out the channel of said television program at the time identified by said pre-coded number stored in said
15 memory and tracked by said clock means.

10. A method for preprogramming a television to block-out a cable TV signal comprising:

inputting a pre-coded number into a blocking device
20 which identifies the time and channel of a television program to be blocked out on said television set;

tracking the real time date and time;

storing said pre-coded number in a memory;

blocking out the channel of said television program
25 identified by said pre-coded number stored in said memory at the appropriate date and time.

1/5

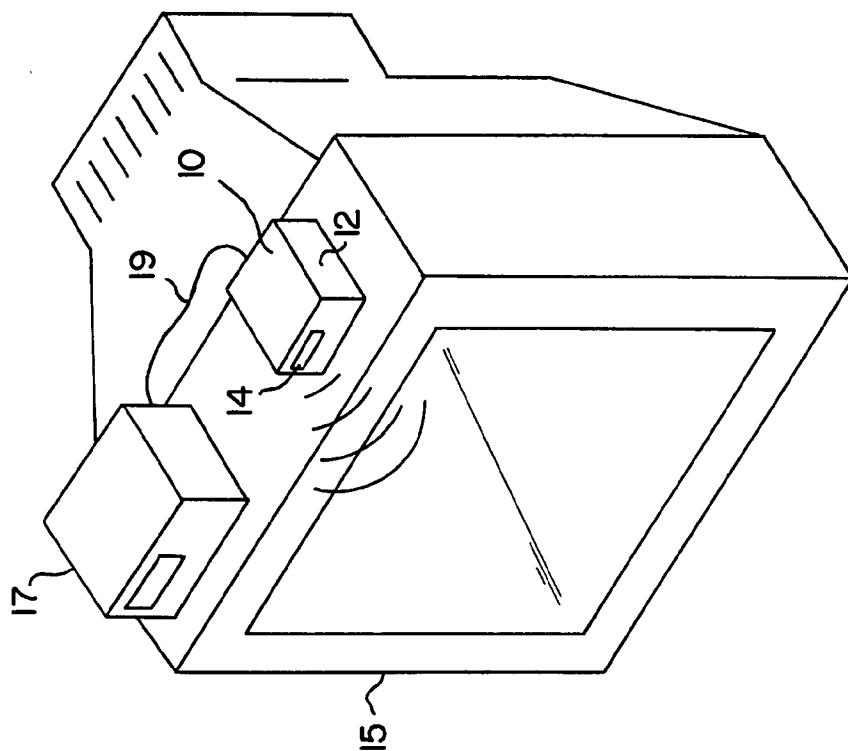
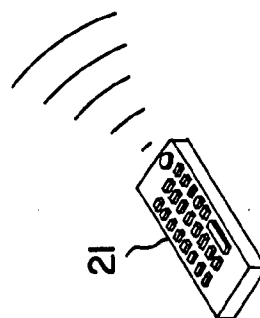
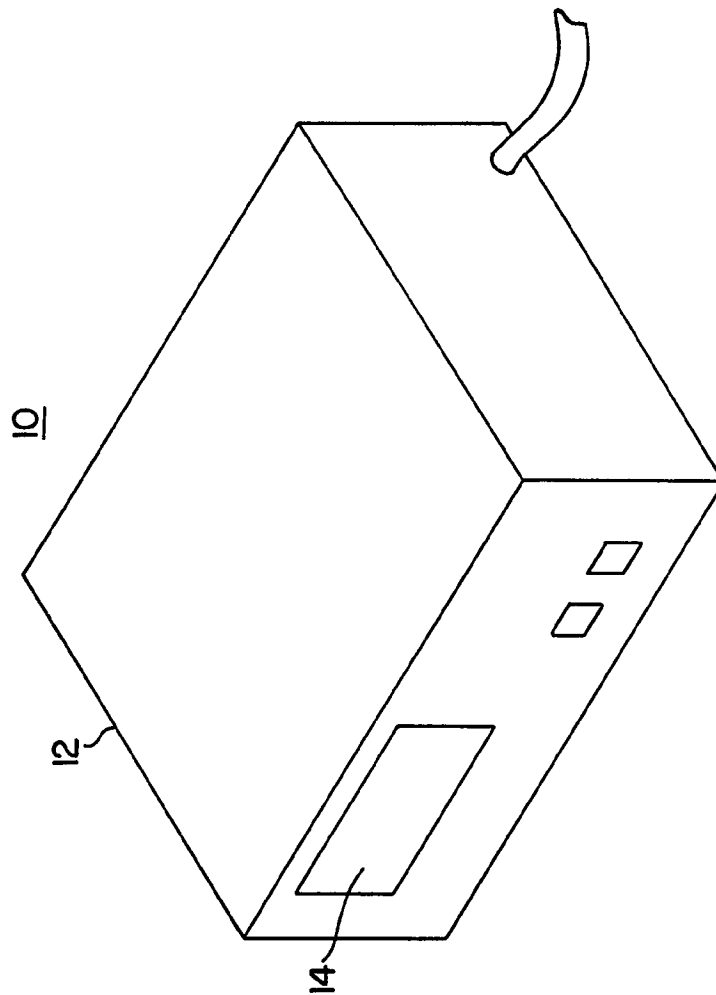


FIG. 1



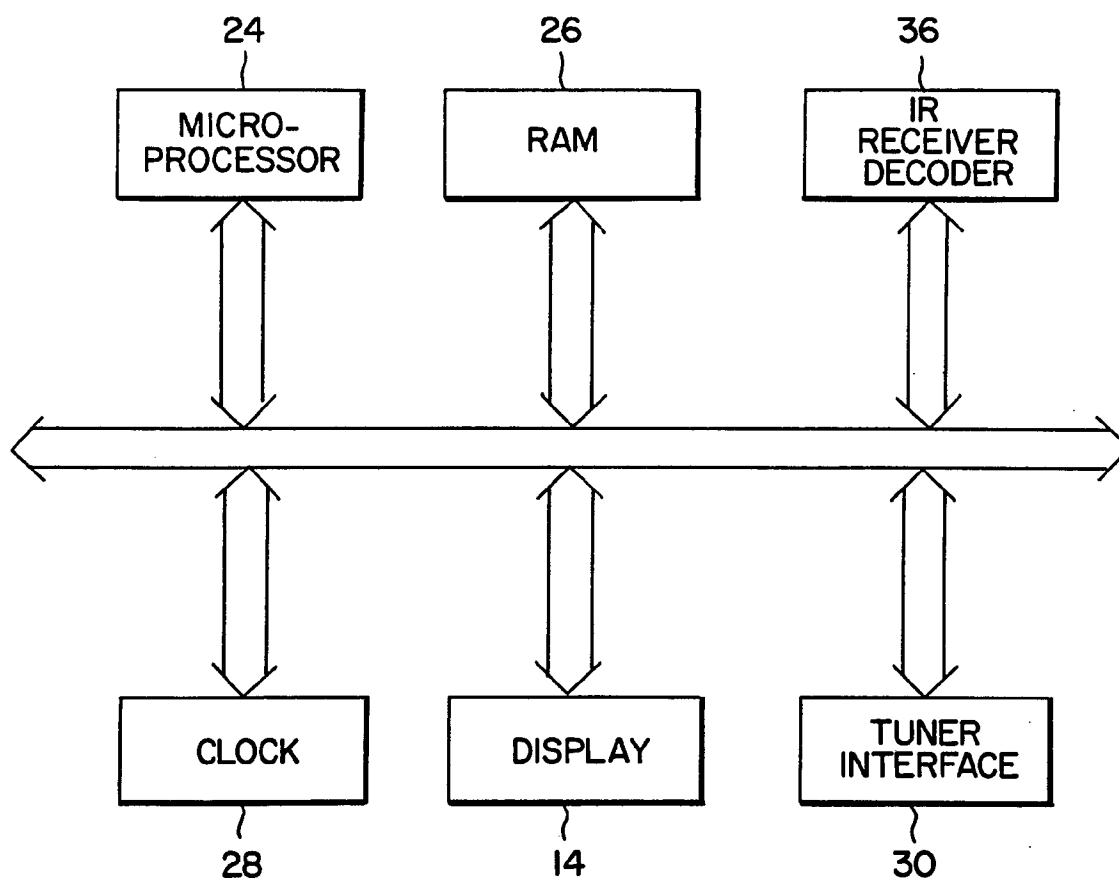
2/5

FIG. 2



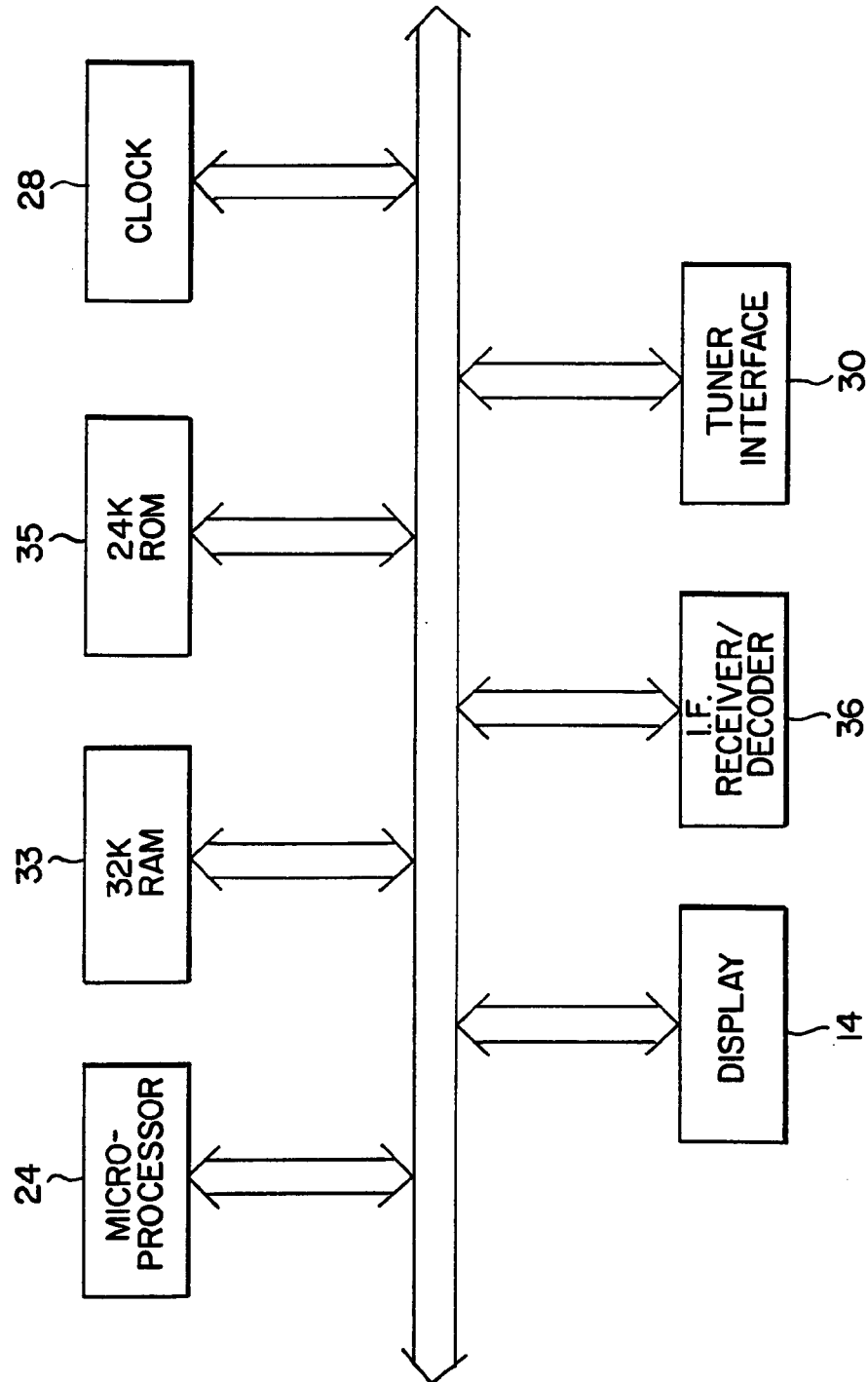
3/5

FIG. 3



4/5

FIG. 4



5/5

FIG. 5A

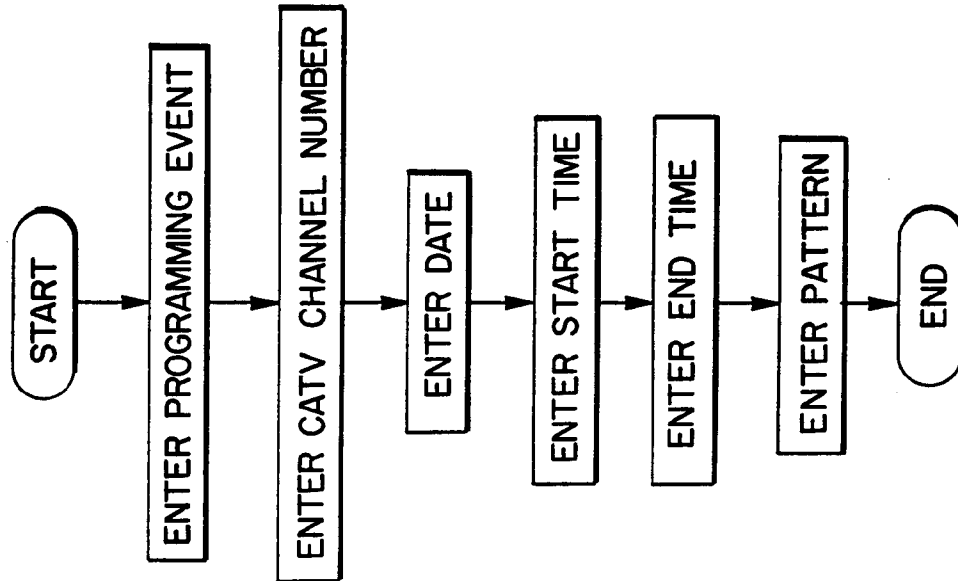
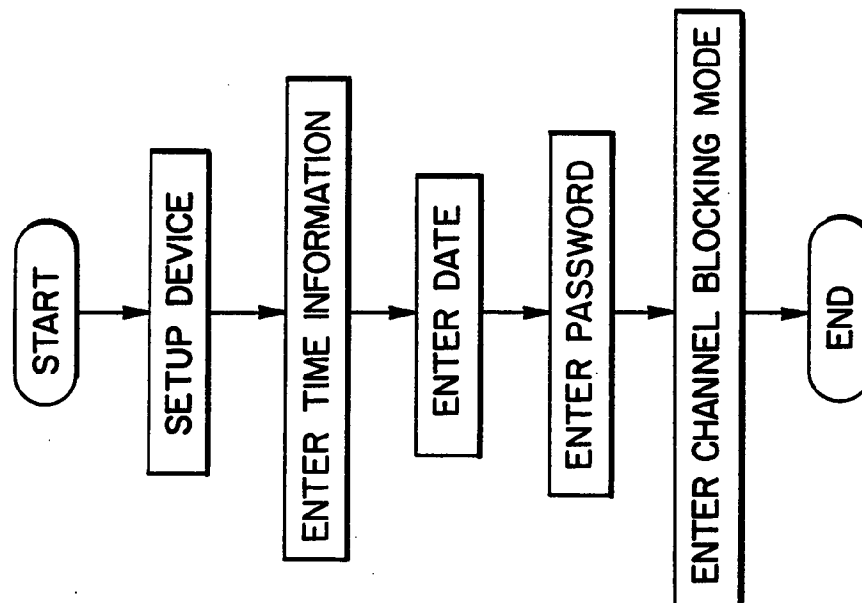


FIG. 5



INTERNATIONAL SEARCH REPORT

International application No.
PCT/US95/03217

A. CLASSIFICATION OF SUBJECT MATTER

IPC(6) :H04N 7/00

US CL : 348/ 5.5

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 348/ 5.5, 10, 460, 634, 725, 731, 734, 906; 455/ 26.1; H04N 7/00, 7/08, 7/087, 7/10

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
none

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
none

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X,P	US, A, 5,382,983 (KWOH ET AL.) 17 JANUARY 1995, see entire document.	1-10
Y	US, A, 4,635,121 (HOFFMAN RT AL.) 06 JANUARY 1987, see entire document.	1-10
Y	US, A, 4,706,121 (YOUNG) 10 NOVEMBER 1987, see entire document.	1-10
Y	US, A, 4,751,578 (REITER ET AL.) 14 JUNE 1988, see entire document.	1-10
Y	EP, A, 0,447,968 (RCA LICENSING CORPORATION) 25 SEPTEMBER 1991, see entire document.	1-10



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents:	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A" document defining the general state of the art which is not considered to be part of particular relevance	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E" earlier document published on or after the international filing date	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"A" document member of the same patent family
"O" document referring to an oral disclosure, use, exhibition or other means	
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search

08 MAY 1995

Date of mailing of the international search report

16 AUG 1995

Name and mailing address of the ISA/US
Commissioner of Patents and Trademarks
Box PCT
Washington, D.C. 20231

Facsimile No. (703) 305-3230

Authorized officer

DAVID E. HARVEY

Telephone No. (703) 305-4365